MONITORING OF WATER AND LAND RESOURCES BY USING RS: EXAMPLE FROM GEORGIA

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NATIONAL ENVIRONMENTAL AGENCY

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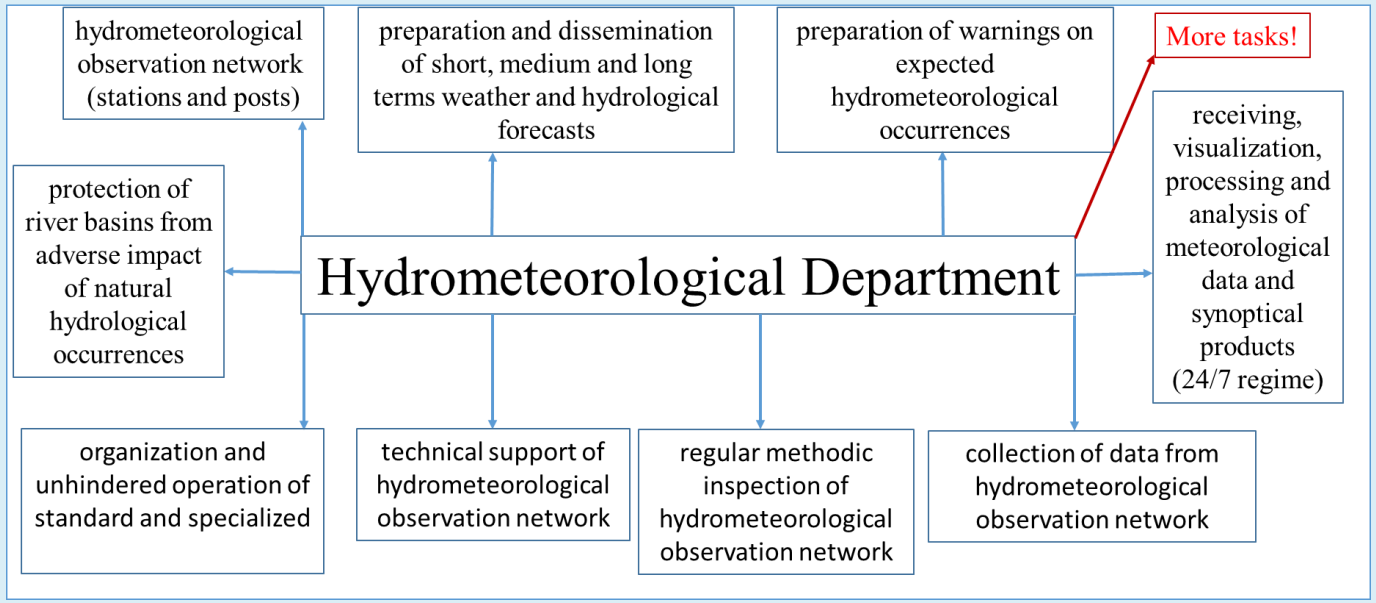
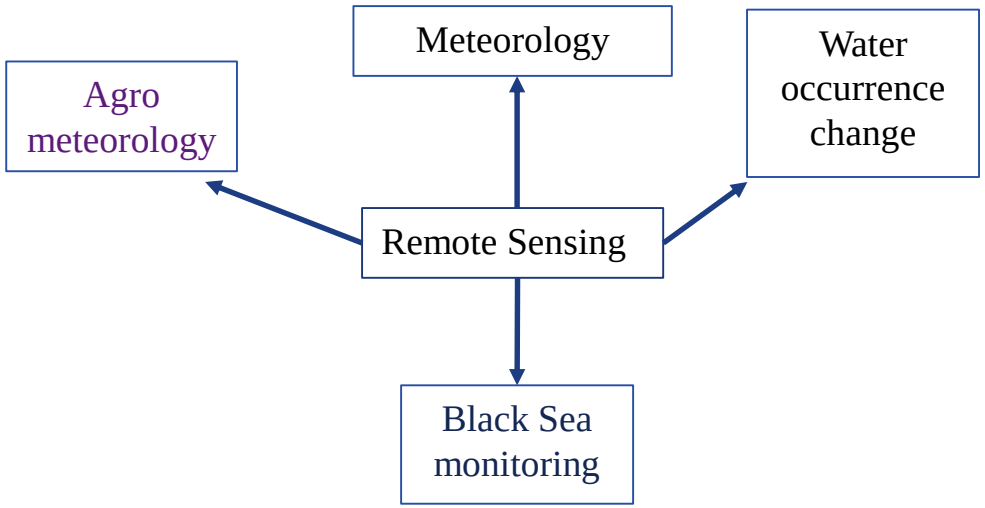
From previews meeting: ISTC Water Management Seminar in Almaty on 20th and 21st April 2017





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Progress I

- Storms and rainfalls study
- Observation of floods due to the strong rainfall
- Nowcasting weather

Source:
https://www.eumetsat.int/website/home/Images/ImageLibrary/DAT_3689436.html

USING MULTI-SENSOR PRECIPITATION ESTIMATES (MPE) FOR CONVECTIVE EVENT IN GEORGIA

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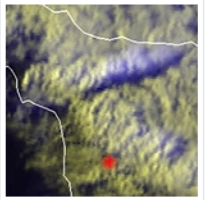
This study compared the MPE products and ground observation data from a local meteorological station in the western part of Georgia (Caucasus) during a strong storm.



Date & Time	14 June 2017 23:00 UTC—15 June 13:00 UTC
Satellites	Meteosat-8, Metop-A
Instruments	SEVIRI, Special Sensor Microwave Imager (SSM/I)
Channels/Products	Multi-sensor Precipitation Estimates (MPE). High Resolution Visible (HRV)

By Elena Nikolaeva (Georgian National Environmental Agency Hydrometeorological Department) and Jochen Kerkmann (EUMETSAT)

Satellite Multi-sensor Precipitation Estimates (MPE) products are widely used in climate studies, numerical weather prediction, nowcasting and other applications. Therefore, it is important to estimate accuracy and limitations of satellite precipitation estimates.

The MPE algorithm assumption is that colder clouds are more likely to produce precipitation than warmer clouds. It uses available Meteosat Second Generation satellite images with 15 min temporal resolution.

On 15 June 2017 there were several heavy rainfall events in western parts of Georgia. The first started around 3 am local time (Wed 14 June 23:00 UTC) and, according to ground-based observations data from the Zugdidi meteorological station there was 5 mm of precipitation. The MPE product coincides with ground-based data for that time (Figure 1, see arrows).

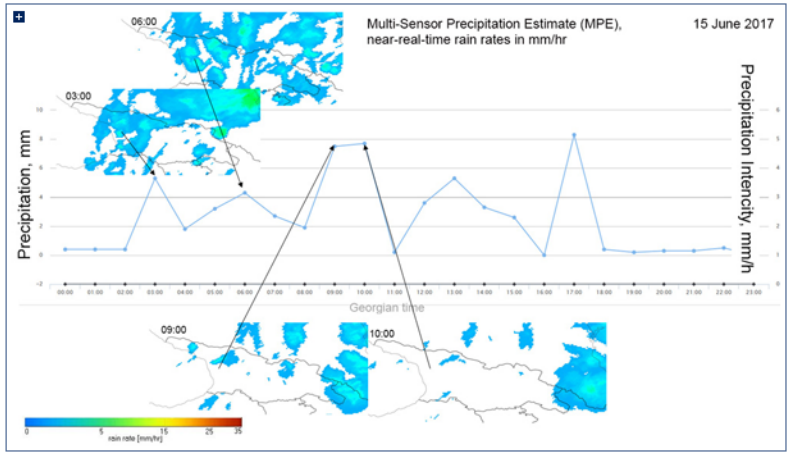


Figure 1: Observations plot. Arrows link from MPE products at the location of meteorological station to precipitation data from this station (in local time). Colour bar is same for all MPE products (spatial distribution of precipitation for the fixed time).

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Progress II

- Wildfires monitoring

  Borjomi (20-26 Aug 2017)

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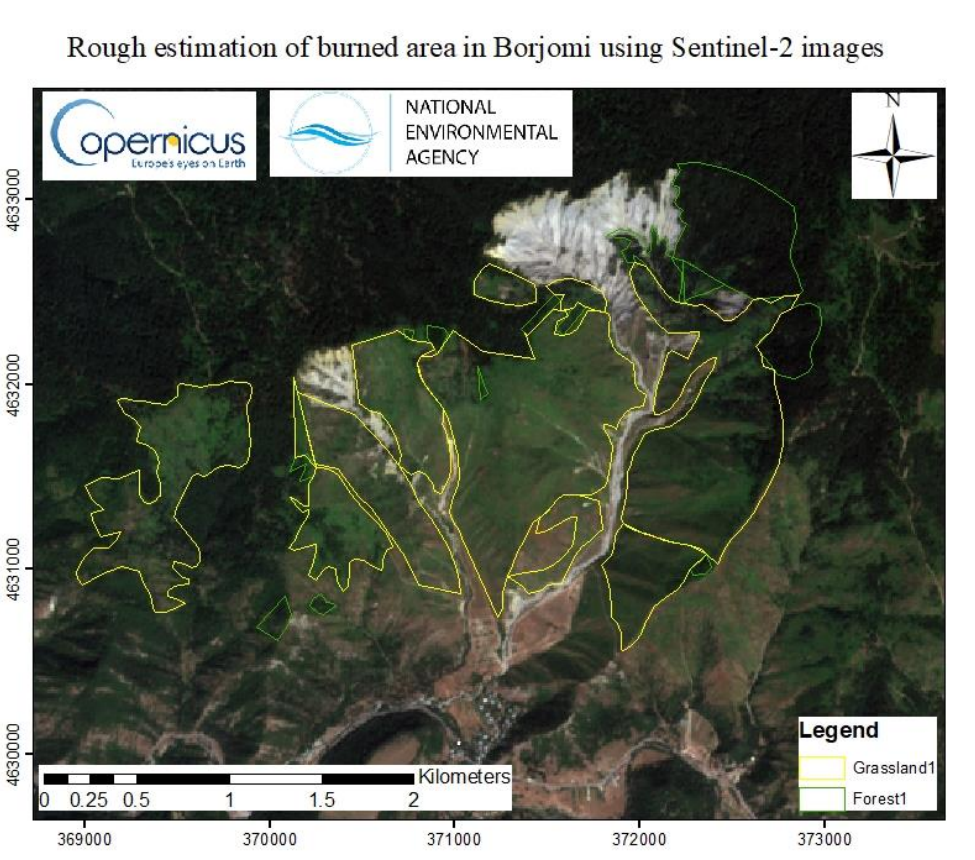
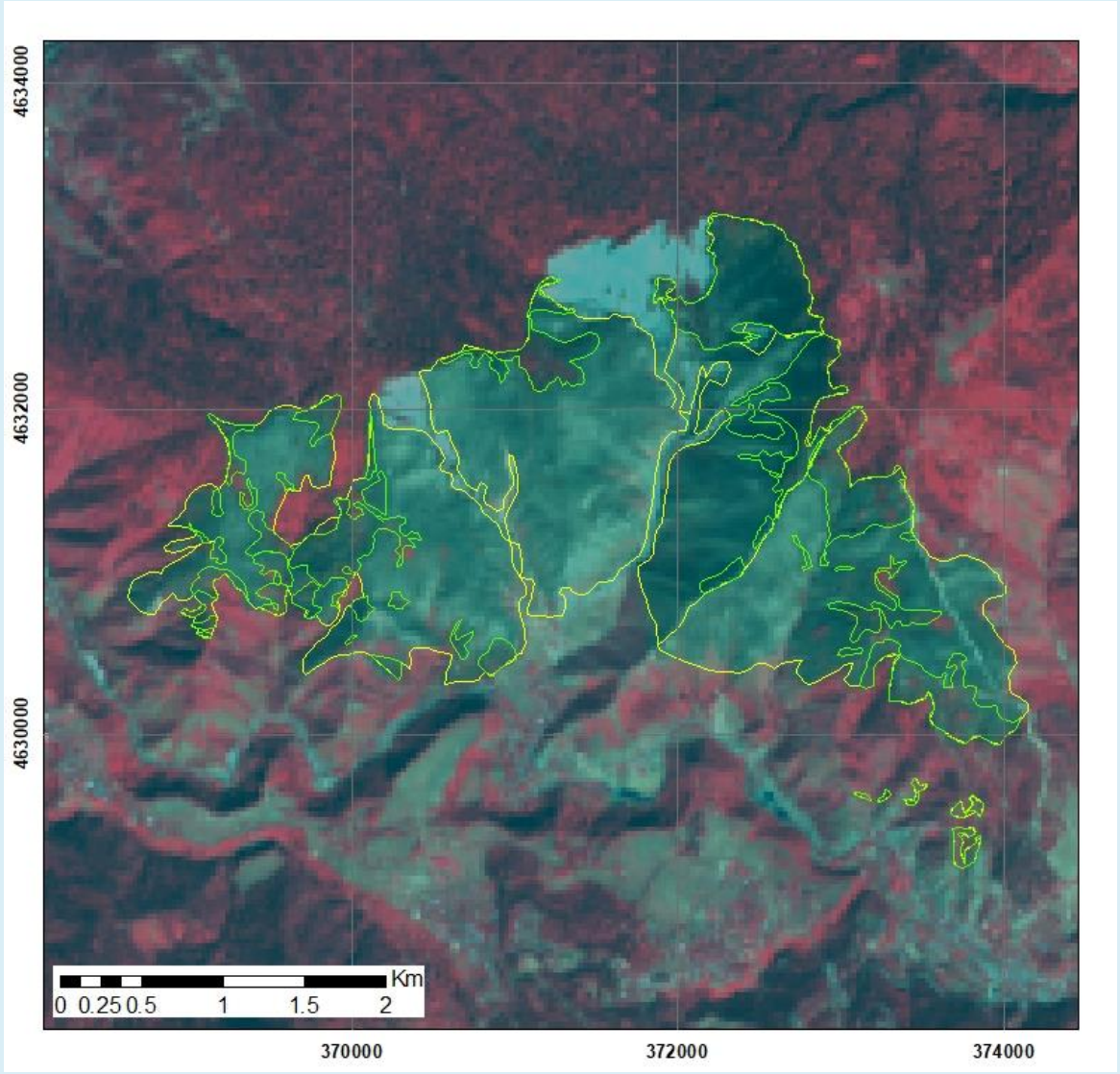
Progress II

- Estimation of burned area





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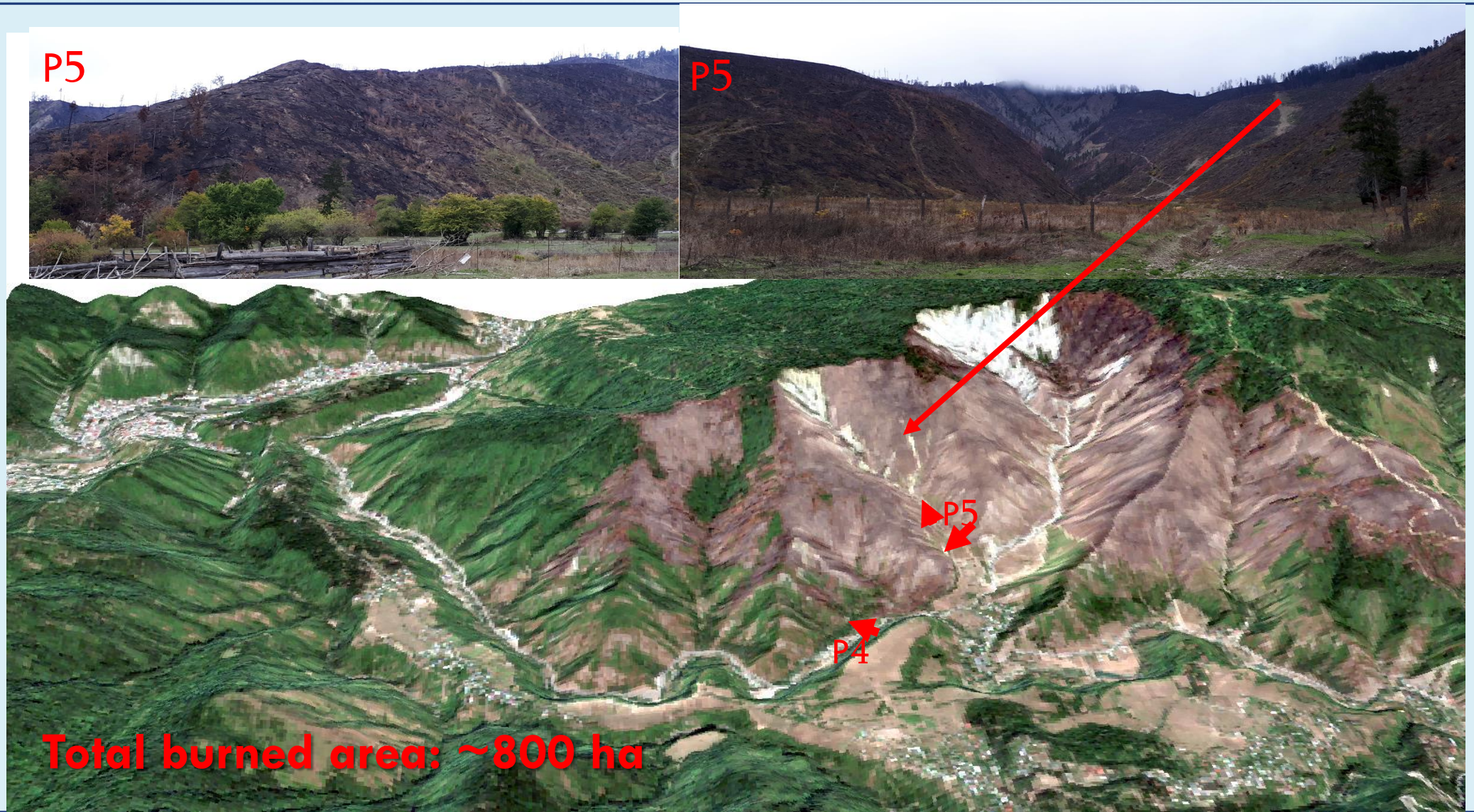

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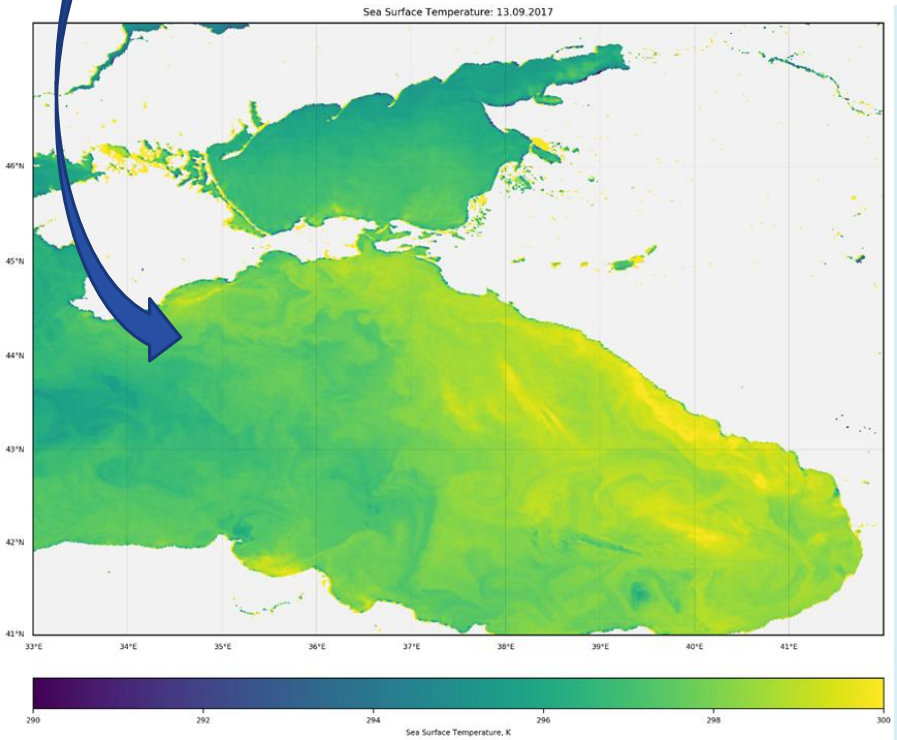
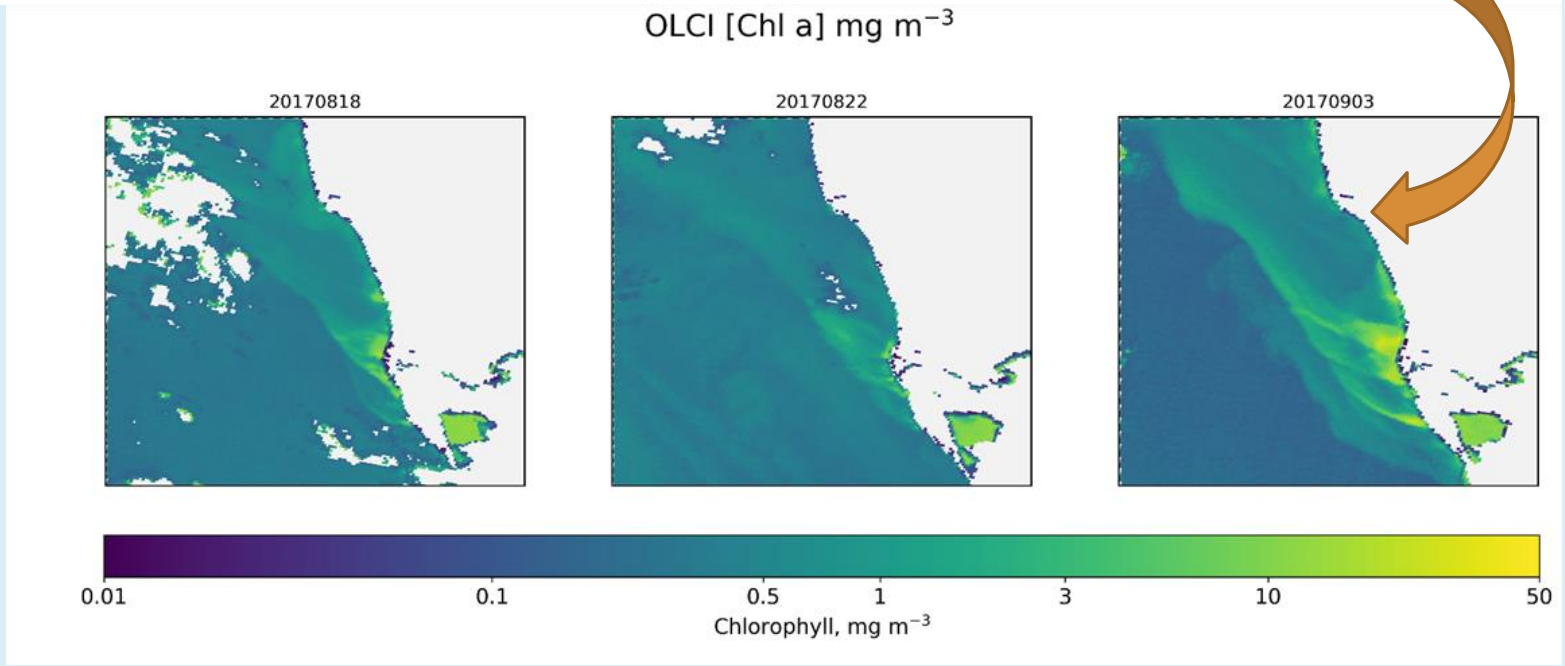
Progress III

- Measure **ocean surface temperature** (spatial resolution is 1 km)
- Measure **ocean surface colour** (spatial resolution is ~300 m)





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Progress IV

Monitoring of glacier fluctuations and effects on water resources in light of climate change in CA and Caucasus using RS

The Earth Policy Institute (www.earth-policy.org) published that glacial volume in the Caucasus has declined approximately by 50% during the last century and will decrease more severely in the future.

Although, the glacier melting process is active, the number of glaciers is increased due to the fragmentation of the large one to the pieces.

The variations in glaciers have an impact directly on the changes of the river basins, which used for the agricultural irrigation, potable water, power generation, and ecosystem integrity. The project may focus on one of the large northern river basins, such as Kura.

Source: https://en.wikipedia.org/wiki/Kura_(Caspian_Sea)

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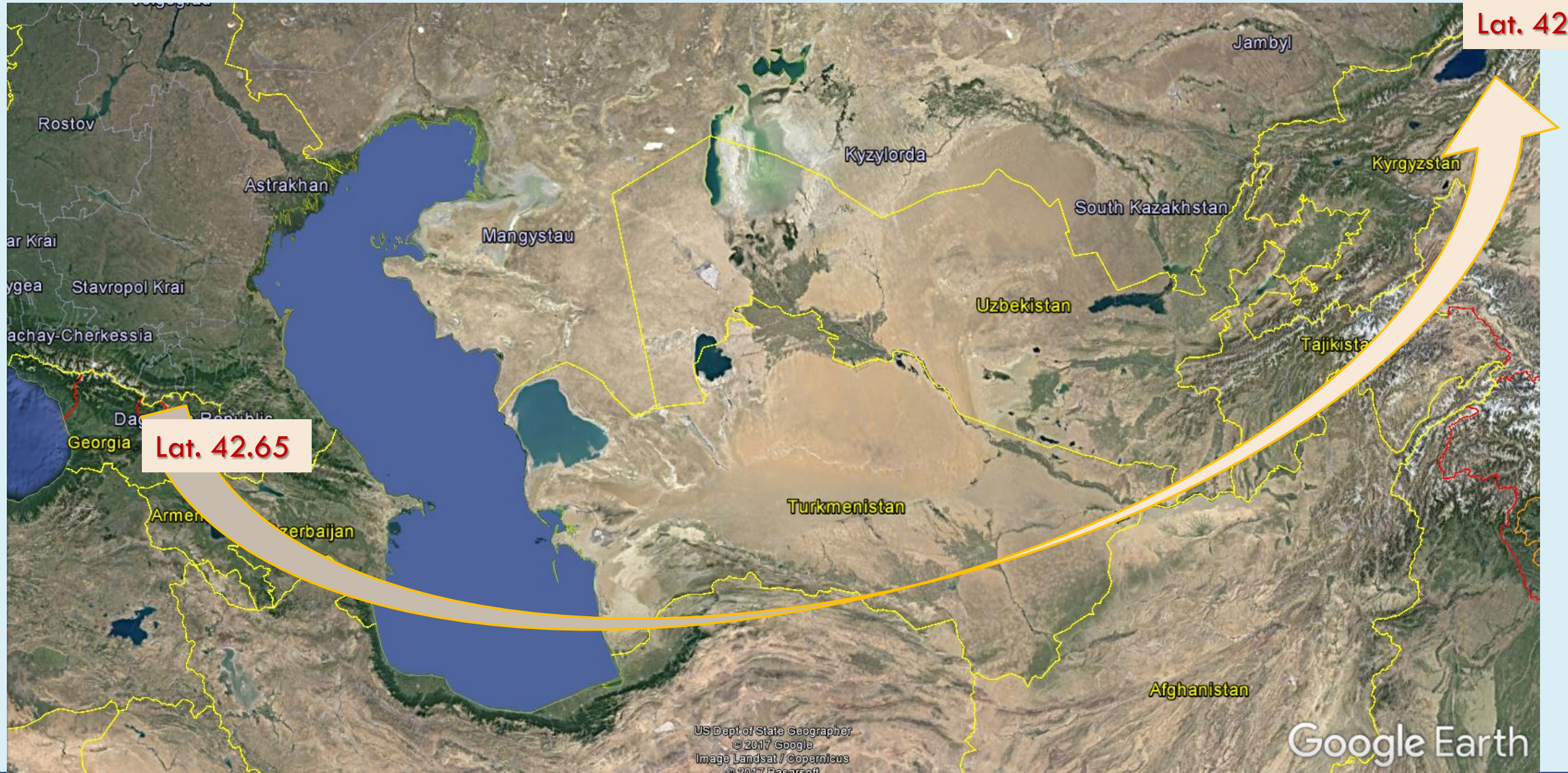

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Summary:

Increasing mean and extreme air temperatures, relative humidity, moisture regimes, average annual precipitation lead to changes in the environmental such as increased frequency of floods (Progress I), melting of glaciers (Progress IV), droughts (Progress II) and so on.

Thank you!

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